Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: April 2006

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TABLE OF CONTENT

4. List of Figures

1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity, which is referred as "specific conductance" (SC). The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below to ensure salinity standards are met to protect habitat for waterfowl in managed wetlands:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	North-Central Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of April, 2006, salinity conditions at all five compliance stations are in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of March was determined for each compliance station by comparing the progressive daily mean of high-tide SC with respective standards. The standard for compliance stations C-2, S-64, S-49, S-42 and S-21 are 11.0 mS/cm during April 2006. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is shown below.

$$PDM = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

Outflow for April 2006 was a record high from the beginning to the end of the month. Outflow ranged between 122,000 cfs and 250,000 cfs during the month. The lowest outflow observed for the entire month was about 122,000 cfs and occurred at the end of the month. The largest outflow peaked on April 6, 2006 at about 246,000 cfs. Unusual precipitation events during the first half of April along with continued high outflow carry over from previous month resulted outflow levels in April to be a record high. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for April 2006 is listed below:

Month	Mean NDOI (cubic feet per second)
April	178,316

2.3 Rainfall

April total rainfall of 4.96 inches was slightly higher than previous month total of 4.80 inches, which is unusual since past April rainfall totals are very minimal. Most of the rain activity occurred in the first half of the month, with the largest daily rainfall total of 1.31 inches on April 12.

Month	Total Rainfall (inches)
April	4.96

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during April 2006 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
April 1 – 30	Open	Out	Open

Due to continued high outflows and unusual rainfall events in April 2006, salinity levels in marsh remained extremely low and gates remained inoperable with flashboards still out of the maintenance channel. DWR will continue to monitor salinity levels in the marsh and will re-operate the gates and install the flashboards if conditions warrant, however, based on current hydrologic conditions and past experiences, more than likely the gates will not be operational for the remainder of the control season.

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operation of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

During April 2006, salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), and Volanti(S-42) were all below 2.0 mS/cm as shown in Figure 1. Salinity levels throughout April remained flat line because salinity level has reached the maximum freshness. As for the two monitoring stations, S-35 and S-97, salinity levels remained below 3.0 mS/cm as shown in Figure 2. These monitoring stations salinity level pattern was similar to the other compliance stations salinity, where there were very little to no salinity fluctuation throughout April because salinity levels have reached its maximum freshness but to a slightly higher degree of salinity.

S-21 (Sunrise Club) continued to be inaccessible since late December 2005 due to flooded roadways, thus data was not available to report at S-21 station. However, given the extremely low salinity levels throughout the marsh, standard at S-21 was more than likely met.

Overall, salinity levels in April 2006 were well below standards at all compliance and monitoring stations.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for April 2006 were compared with means for those months during the previous nine years (Figure 4).

Mean salinity pattern of all compliance and monitoring stations resembles that of 1998, except for stations S35 and S97. Compared to 1998, these two monitoring stations in 2006 are flip-flopped; S35 salinity is higher than 1998 value and S97 is lower than 1998 value.

Table 1

Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations

April 2006

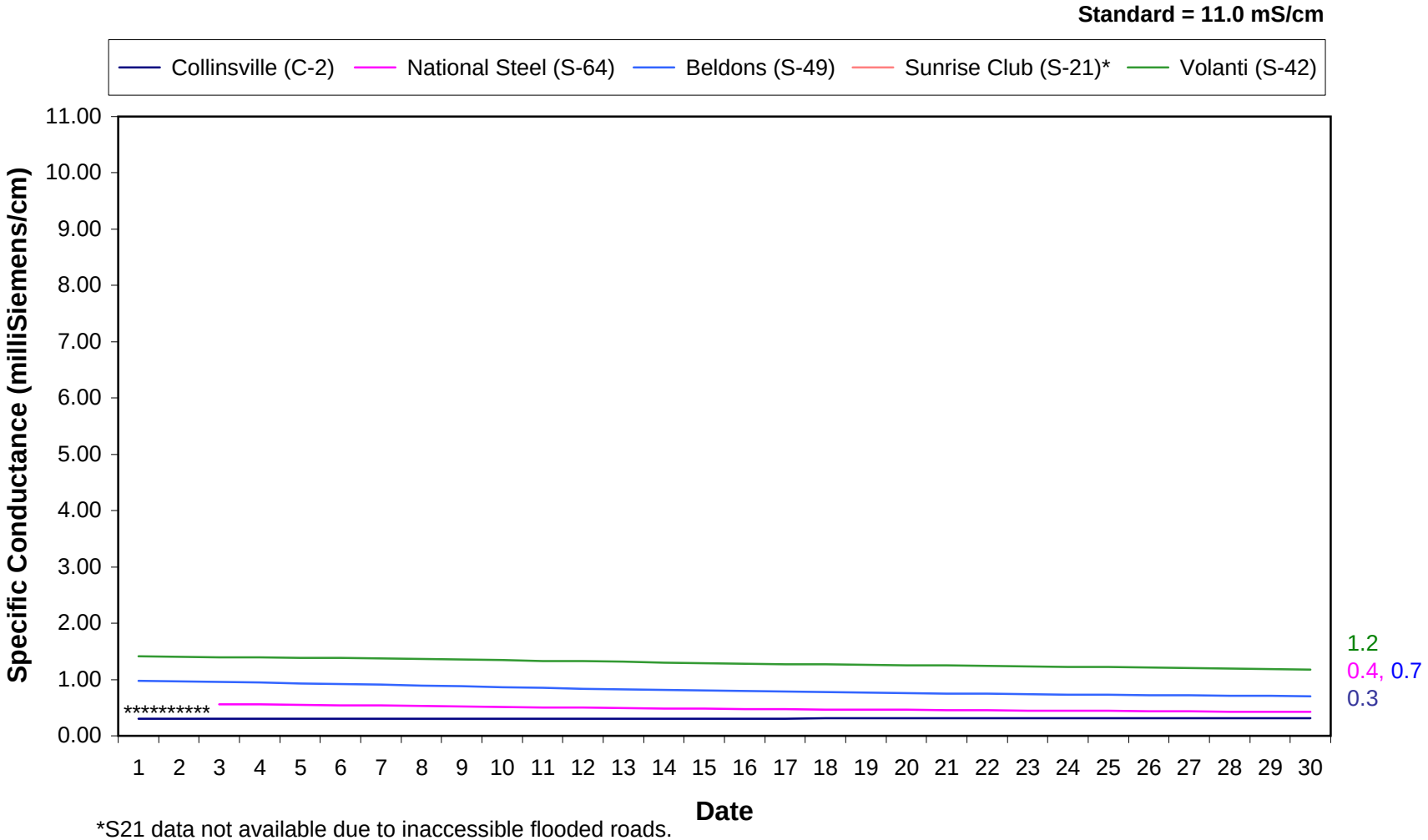
Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	0.3	11.0	Yes
S-64	0.4	11.0	Yes
S-49	0.7	11.0	Yes
S-42	1.2	11.0	Yes
S-21***	n/a	11.0	Yes

*milliSiemens per centimeter

**The representative data from nearby USBR station is used in lieu of data from station C-2.

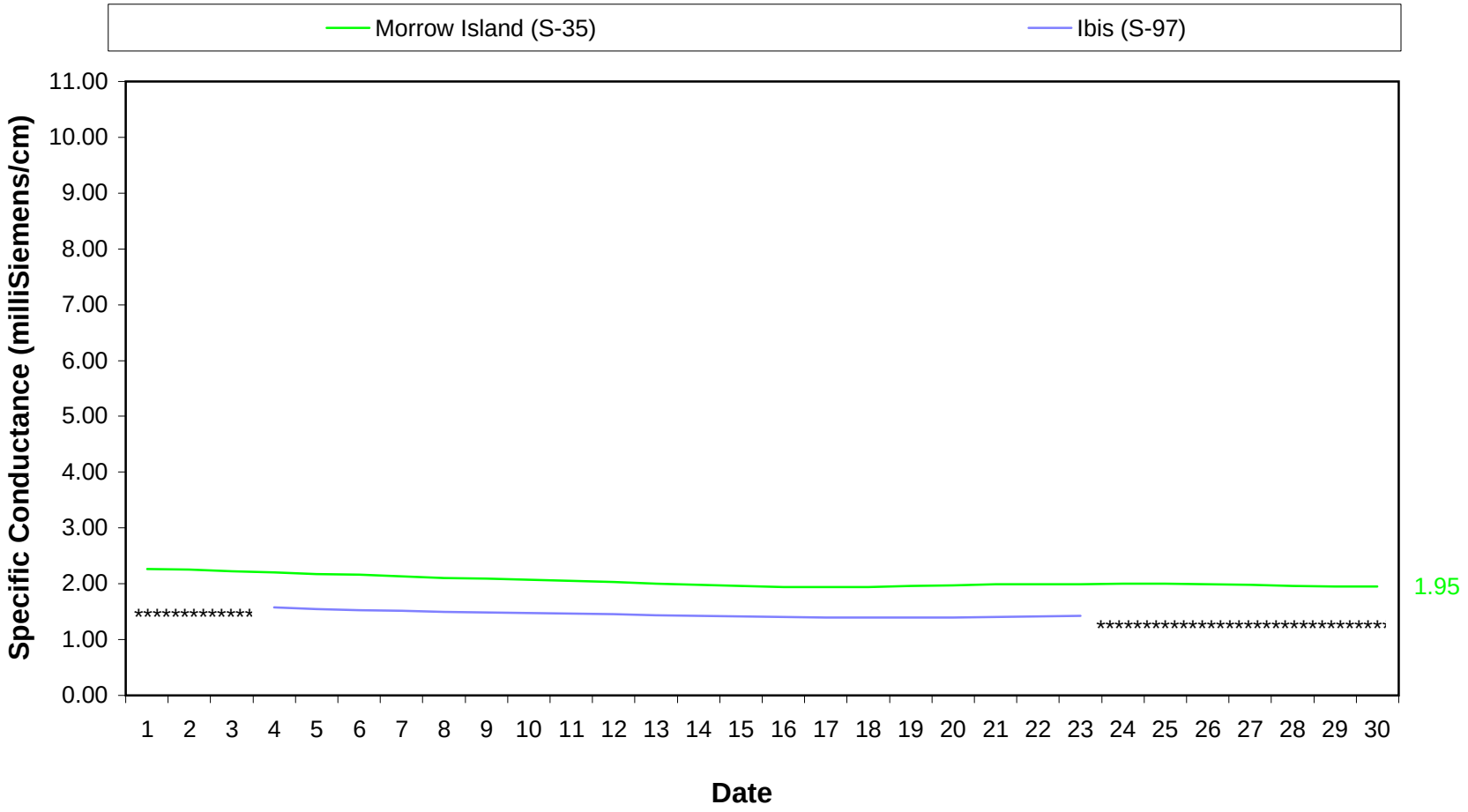
***station data was not accessible due to flood water, thus salinity information is not reported. However, salinity levels throughout the marsh was so fresh that standard at this station was likely met.

Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance
April 2006



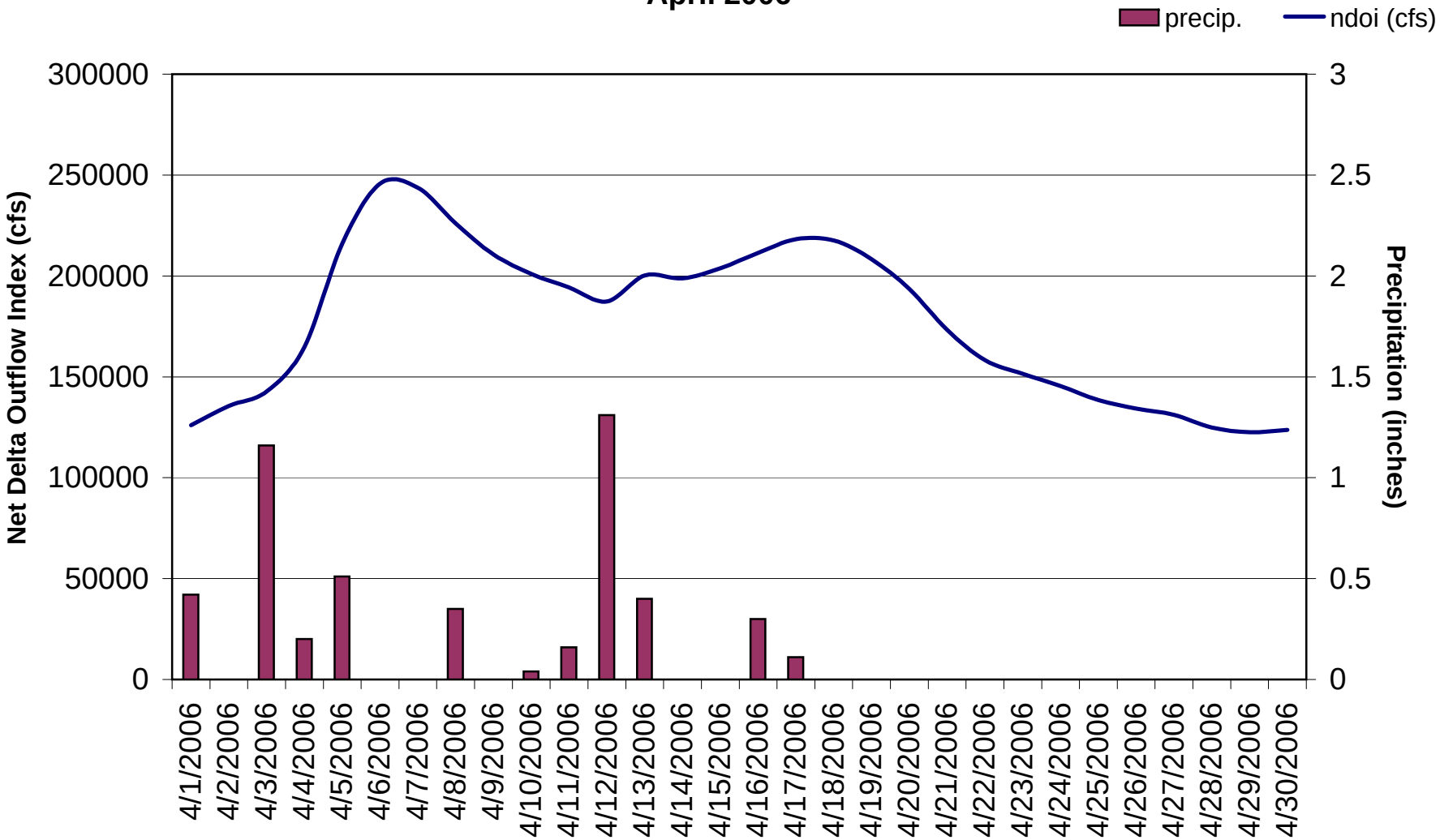
*S21 data not available due to inaccessible flooded roads.
*******Missing data due to equipment problem.

Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance
April 2006



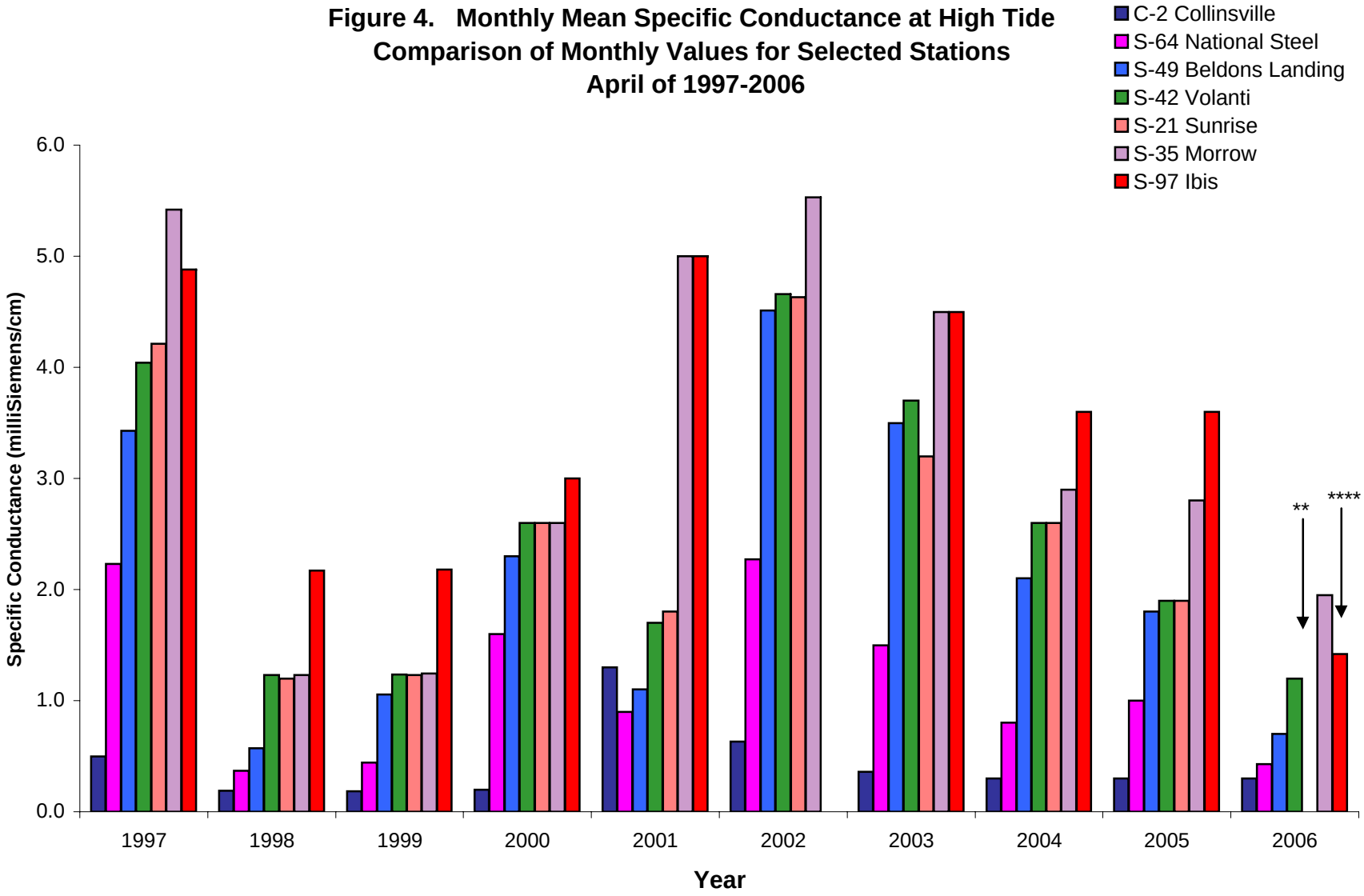
*******Missing data due to equipment

Figure 3. Daily Net Delta Outflow Index and Precipitation*
April 2006

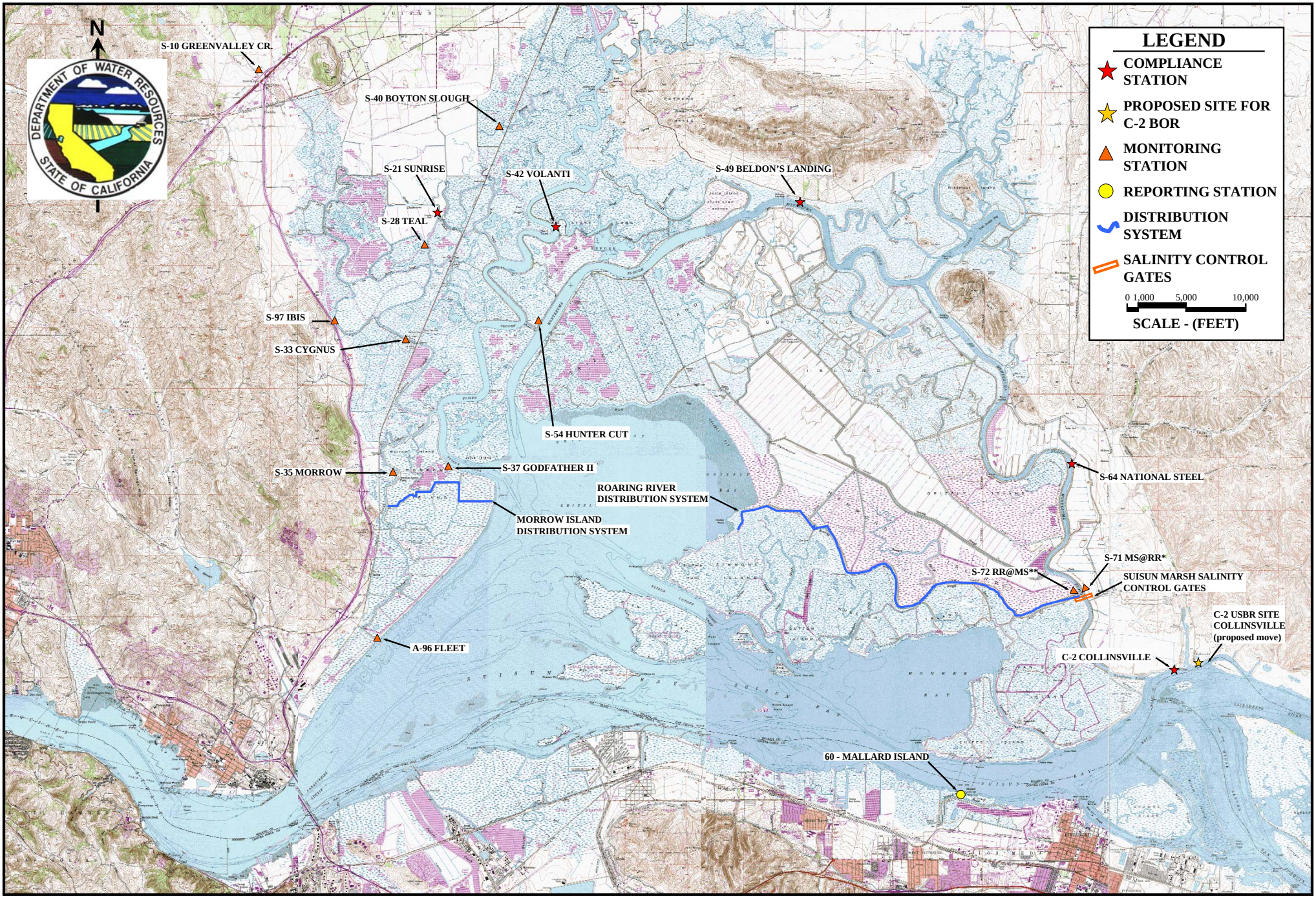


*Preliminary DWR, O&M data; no precip. observed in April 2006

Figure 4. Monthly Mean Specific Conductance at High Tide
Comparison of Monthly Values for Selected Stations
April of 1997-2006



**S21 data not available due to flooded roads.
****S97 data not representative of end of month value due to missing data within the month.



SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES